

Appl. No. 10/615,753
Atty. Docket: 99B024/5
Amendment dated June 22, 2007
Reply to Final OA mailed May 3, 2007

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REMARKS/ARGUMENTS

Application Amendments

By the amendments presented, claims 80-91 and 129 would be cancelled without prejudice. These claims would be added to the list of previously cancelled claims which include claims 1-50, 59, and 69.

Also by the amendments presented herein, claims 92 and 130 would be rewritten to specify that the steps of the claimed method take place as part of a catalyst production-to-use procedure. Exemplary support for addition of this element to claims 92 and 130 can be found in the specification as originally filed, *e.g.*, at page 2, lines 8-34, page 8, lines 14-16, and page 9, lines 19-20.

Also by the amendments presented herein, claim 92 would be further rewritten to indicate that the catalytic sites within the molecular sieve are shielded by means of a template, an anhydrous liquid, or an anhydrous gas. Exemplary support for this amendment to claim 92 can be found in original claim 93, which accordingly would also be rewritten to direct it to a preferred shielding means, namely a template.

Also by the amendments presented herein, claim 128 would be rewritten to recite a storage environment or regenerator as a preferred heated system in which the activated catalyst is held. Exemplary support for this amendment can be found in claim 129, which, as noted, would be cancelled.

Upon entry of the claim amendments presented herein, claims 51-58, 60-68, 70-79, 92-128, and 130-135 would remain in the application. No additional claims fee would be due as a result of these amendments. No new matter would be added.

Invention Synopsis

The claimed invention is directed to methods and systems for protecting the catalytically active sites within a molecular sieve or molecular sieve catalyst from moisture-caused deactivation, typically while such sieves or catalysts are being stored, transported, or loaded, after their production and before their use in a catalytic conversion process. Such sieves can have their catalytic sites protected by shielding these catalytic sites. Shielding can be effected by leaving the sieve-forming organic template in place within the sieve, by forming carbonaceous

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deposits in or on the sieves, and/or by maintaining the sieves or catalysts in contact with an anhydrous liquid or anhydrous gas.

After such shields of the catalytically active sites have been removed, the catalytically active sites in the sieves or catalysts can still be protected against deactivation by a moisture-containing environment, if that moisture-containing environment is maintained at a temperature of 150°C or above. This can be done by holding the sieves or sieve-containing catalysts within a regenerator or a storage environment. Protection of the catalytically active sites from moisture-caused deactivation can be effected by the methods and systems of this invention, such that the sieves or catalysts can have a methanol uptake index of at least 0.15 when the sieves or catalysts are activated and before they are used in catalytic conversion processes.

Art Rejections

In the Final Office Action, the Examiner maintains the 35 U.S.C. §103(a) rejection of all application claims as allegedly being obvious over Lewis *et al.* (U.S. Patent No. 4,973,792, hereinafter "Lewis"). The Examiner again contends that Applicants' amended claims still read on the Lewis disclosure of a conversion process using molecular sieve catalyst particles, which are regenerated *in situ* within the reactor, with Applicants' recited methanol uptake values being inherently provided by the activated catalysts in Lewis. Such a rejection is again respectfully traversed as it would apply to the claims as amended herein.

Lewis discloses a process for catalytically converting a feedstock, wherein fluidized catalyst particles are contacted with a feedstock to convert the feedstock to product. The mass of catalyst particles in the reactor is then contacted with a purge medium to reduce the amount of feedstock and product in contact with the catalyst. The mass of catalyst particles is then contacted *in situ* within the reactor with a regeneration medium to improve the catalytic properties of the catalyst particles. (Lewis does note that *in situ* catalyst regeneration may not be completely suitably effective so that a small amount of catalyst may still need to be removed and sent to a regenerator.) After *in situ* catalyst regeneration, the catalyst in the reactor can then again be purged with, for example, steam at 500°C. The Lewis cycle of reaction, purge, regeneration, and optionally purge again, is repeated periodically.

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There is no disclosure in Lewis concerning the problem of catalyst deactivation caused by contact with moisture and no disclosure in Lewis of any attempts to prevent catalyst deactivation during storage, transport, or loading of the catalyst particles involved in the Lewis process. Lewis, for example, exemplifies catalyst preparation and then loads the prepared catalyst into reactors for testing. Lewis, however, is completely silent as to the conditions under which the prepared catalysts are maintained after their preparation and before their use in the Lewis reactors. Example 28 of Lewis further exemplifies a commercially sized fluidized bed reactor setup, but again is completely silent as to what kind of catalyst is used therein, how that catalyst is prepared and/or activated, and what conditions the catalyst is subjected to, or maintained under, before it is put into and used in the reactor system.

It is respectfully submitted that Applicants' claims as amended herein do not read on any method or catalyst/system combination disclosed in or suggested by Lewis. This can be seen by looking at each independent claim of the present application and noting which elements thereof are not disclosed or suggested by Lewis. See, for example, the following.

Claim 51 requires providing an activated catalyst and then loading it into a heated system wherein it encounters certain conditions before catalytic use. It is true that an activated catalyst may be provided by the *in situ* regeneration of catalyst in the Lewis reactor. But that Lewis catalyst, upon activation by *in situ* regeneration, is not then "loaded" into a heated system such as a reactor. It is, in fact, already in a reactor at that point and is not "loaded" anywhere.

Claim 61 requires loading of an activated, unshielded catalyst into a reactor or regenerator and then exposing that catalyst to moisture at 150°C or higher, before the catalyst is used in a catalytic process. Lewis discloses initial loading of an activated, unshielded catalyst into a reactor, but is completely silent as to what happens to the catalyst in the reactor before the methanol feed is begun and the catalytic conversion reaction starts. There is certainly no disclosure in Lewis about exposing the activated catalyst to moisture before the conversion reaction is initiated.

Claims 71, 103, and 113 require loading of an activated unshielded catalyst into a "storage environment" maintained under certain conditions. In Lewis, the activated, unshielded catalyst is initially loaded into a reactor not a "storage environment." Even after the catalyst in

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Lewis is activated by *in situ* regeneration, that regenerated reactivated catalyst is not sent to any "storage environment."

Claim 92 requires the provision of a catalyst having the catalytic sites therein shielded from moisture by a template or an anhydrous liquid or gas. The catalyst provided in Lewis has the template removed, and the Lewis catalyst is certainly at no time shielded with any anhydrous liquid or anhydrous gas.

Claim 128 requires the combination of an activated catalyst and a storage environment or regenerator, with the catalyst being held in the storage environment or regenerator under certain conditions. Lewis fails to disclose the presence of an activated catalyst in any storage environment or regenerator maintained under any particular conditions. The only conditions of moisture and temperature disclosed in Lewis are for the catalyst held in a reactor.

Claim 130 requires activating a catalyst by removing its shield and then either storing or transporting the activated catalyst as part of a production-to-use procedure or requires loading the activated catalyst into a reactor. The catalyst activated by *in situ* regeneration in Lewis is not stored or transported as part of a catalyst production-to-use procedure. This regenerated Lewis catalyst is furthermore not "loaded" into a reactor, since it is already in a reactor.

It can be seen from the foregoing analysis that none of the claims as amended herein would read on any situation disclosed or suggested by Lewis. As noted hereinbefore, Lewis does not address the problem of catalyst deactivation by moisture contact prior to catalyst use. Lewis, furthermore discloses or suggests no situation where Applicants' claimed solutions to this problem would occur during the Lewis catalyst *in situ* regeneration procedure.

With respect to the issue of the alleged inherent disclosure by Lewis of catalysts having Applicants' specified methanol uptake characteristics, the Examiner, in the Final Rejection, simply repeats the previous erroneous assertion that Applicants' same catalysts are disclosed in Lewis as being handled in Applicants' same way and would therefore inherently possess the same methanol uptake values. However, Lewis itself acknowledges that its *in situ* regeneration procedure may not sufficiently reactivate catalyst to where it can be effectively used to promote conversion reactions, and that accordingly at least some external catalyst regeneration may be needed. The Lewis *in situ* regeneration procedure thus may not provide activated catalyst having Applicants' specified methanol uptake characteristics. It is submitted that Lewis simply does not

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disclose any situation wherein catalysts having Applicants' specified methanol uptake values would inevitably and automatically be expected to be realized.

In light of all of the foregoing considerations, it is again submitted that Lewis has nothing to do with the protection of active catalytic sites during handling of molecular sieves or catalysts prior to catalytic use of such materials and discloses no steps or procedures which would inherently solve, or even address, a catalyst deactivation problem in the manner provided by the various combinations of elements set forth in Applicants' amended claims. Given this situation, it is also again submitted that continued rejection of Applicants' claims, as amended herein, under 35 U.S.C. §103 over Lewis would be improper.

Double Patenting Rejection

The Examiner has also maintained the provisional rejection of the claims in this application for obviousness-type double-patenting over claims 1-69 of the commonly-assigned, co-pending application having U.S. Serial No. 10/641,718. Since the claims of this commonly assigned co-pending application have now been allowed, Applicants are submitting herewith an appropriate Terminal Disclaimer regarding the instant application and its relationship to USSN 10/641,718. Submission of this Terminal Disclaimer should obviate the obviousness-type double-patenting rejection.

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CONCLUSIONS


Applicants have made an earnest effort to place their application in proper form and to distinguish their claimed invention from the applied prior art. WHEREFORE, reconsideration of this application, entry of the claim amendments and Terminal Disclaimer presented, withdrawal of the claim rejection under 35 USC §103 and the double-patenting rejection, and allowance of the claims remaining in the application, are all respectfully requested. Alternatively, entry of the amendments presented herein in order to place the claims in better form for appeal is respectfully requested.

It is also respectfully requested that the Examiner expeditiously notify Applicants' undersigned attorney as to the disposition of the amendments and arguments presented herein in accordance with MPEP §714.13.

Any comments or questions concerning the application can be directed to the undersigned at the telephone number given below.

Respectfully submitted,

Date: 6/22/07


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